Search and Retrieval Protocols

"... they have all one language; and this is only the beginning of
what they will do; and nothing that they propose to do will
now be impossible for them."

Genesis 11:6

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Current Information Systems

- Telephone
- FAX
- Librarians
- Friends
- Print publications

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Internet Systems

- Email
- Netnews
- FTP
- Gopher
- WAIS
- World Wide Web

HTTP, FTP, Gopher+

- Retrieve and Put: little semantics
- Limited forms and commands
- Password based security
- HTTP and Gopher+ are stateless per transaction

Z39.50 and SQL

- Structured protocols
- Requires more sophisticated clients
- Can be used across multiple servers
- Z39.50 can transport and support SQL

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Z39.50 Evolution

Z39.50-v1
Boolean search
Bibliographic Records
Query parsed on client
No relevance feedback
Unlimited result sets
Retrieval by indexing into result sets.
Requires OSI Reference Model
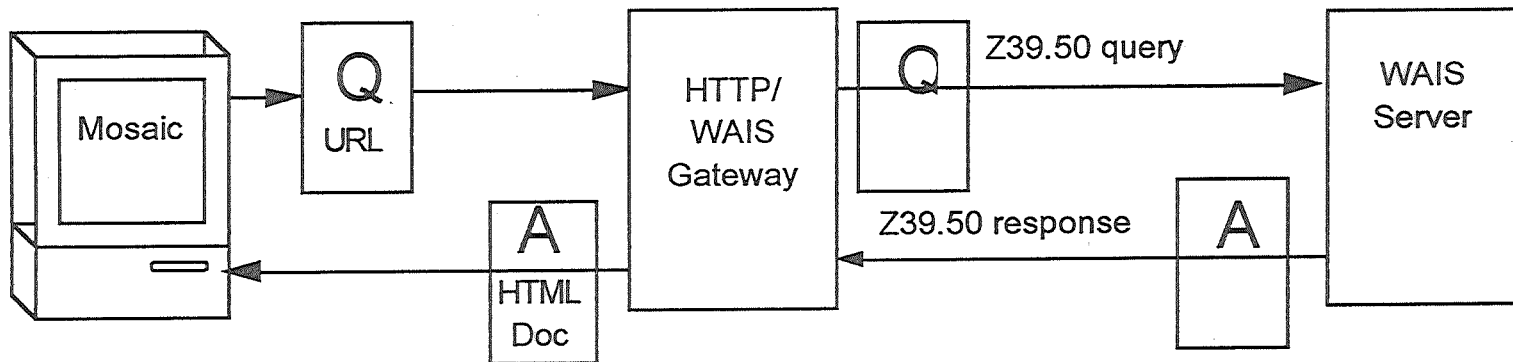Retrieve whole records
One format per document
Return unordered results

Z39.50-v2 with WAIS RFC
Natural language and Boolean
Many media (text, graphics, sound, movies, etc.)
Query parsed on server
Relevance feedback documents
Stateless servert
Uses URLs.
Runs over TCP/IP, X.25, etc.
Retrieve documents in pieces
Multiple formats per document
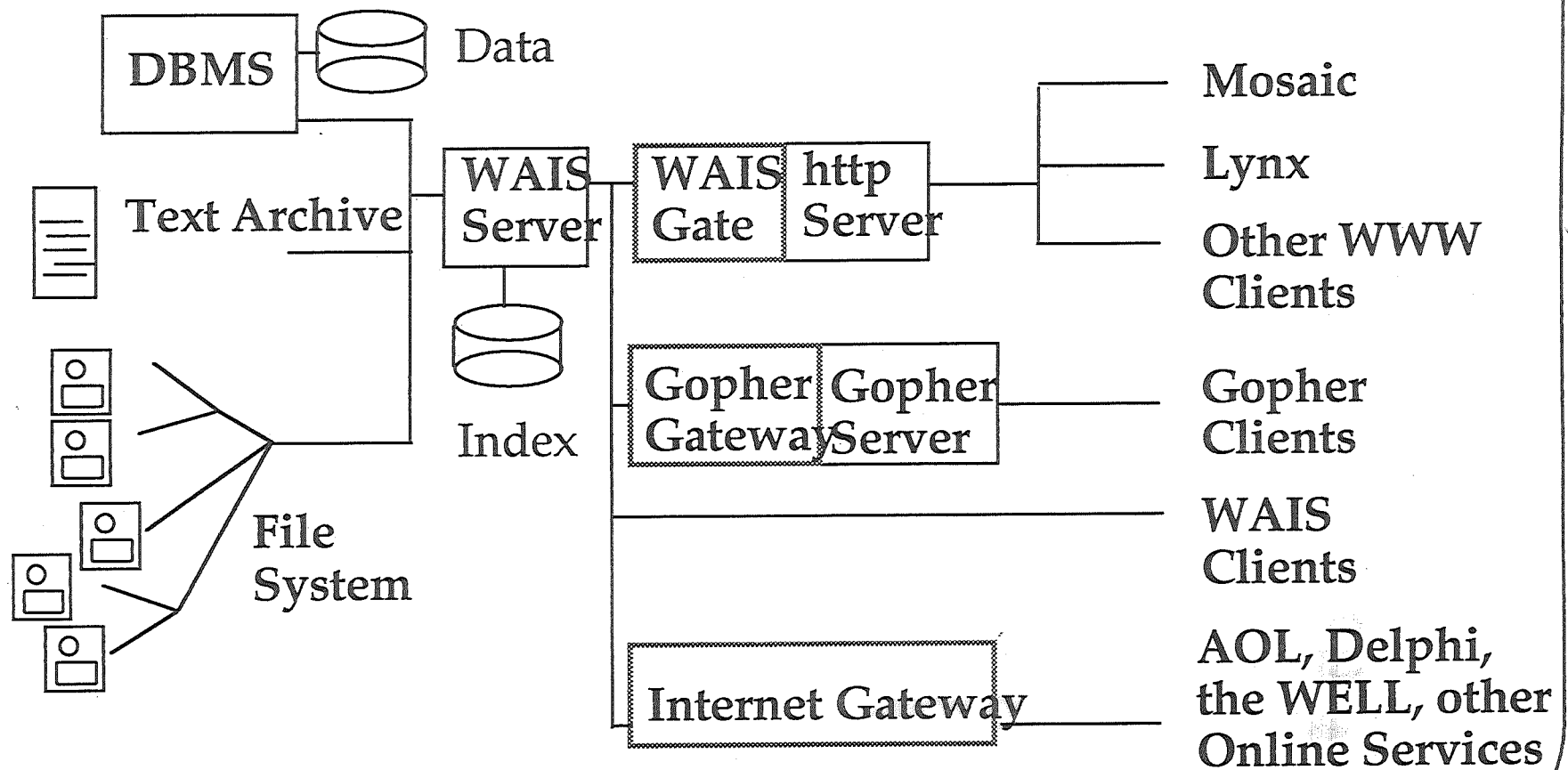Return ranked and scored results

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Z39.50 vs HTTP/HTML

- **WWW is wildly popular**
- **WWW clients are easy to build**
- **WWW clients are inately limited**
- **Z39.50 is not as popular**
- **Z39.50 requires more sophisticated clients**
- **But, Z39.50 allows for more sophisticated clients:**
  - Agents
  - Multi-server searching

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Z39.50 vs HTTP:
Apples and Oranges

Mosaic → Q URL → HTTP/ WAIS Gateway → Q → Z39.50 query → WAIS Server

A HTML Doc ← Z39.50 response ← A

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A Network Publishing Server for Many Protocols

DBMS — Data

Text Archive

File System

WAIS Server — Index

WAIS Gate — http Server — Mosaic / Lynx / Other WWW Clients

Gopher Gateway — Gopher Server — Gopher Clients

WAIS Clients

Internet Gateway — AOL, Delphi, the WELL, other Online Services

Future Directions

- **Towards a Network Book:**
  - Hypertext (active pages, WWW)
  - Browse (table of contents, Gopher)
  - Search (back of the book index, WAIS)
- **Programatic protocols: Postscript Telescript**
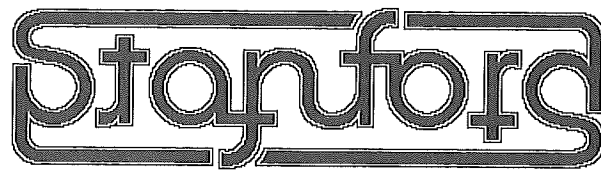- **3-D navigation: Virtual Worlds**

Conclusion

flexible

good enough

- Its a Multi-protocol world and always will be

  standard

- WAIS Inc

  Extensible

  Interoperable

  - http://www.wais.com/
  - info@wais.com
  - 415-617-0444

  Accepted.

Stanford

The Stanford Computer Forum
an Industrial Affiliates Program
at Stanford University

The Stanford Computer Forum

Advances in computer science and technology come about through the efforts of people in both the academic and industrial worlds. Great resources of scientific, professional, and managerial skills exist in both settings. Coming from the academic side, faculty members often become associated with industrial organizations as scientific consultants. These contacts benefit both the companies concerned and the faculty member, who is exposed to areas of investigation which contribute to his or her potential in teaching and research. Another strong tie between the University and industry comes from the many graduates in computer science and engineering who enter careers in industry.

Yet despite these strong natural ties, advances in the science of computing take place so fast and across such a broad front that it is becoming difficult to maintain ongoing and mutually beneficial interaction between university and industry. It is to meet this need that the Stanford Computer Forum has been established, providing a setting where academic and industrial computing talents can easily interact.

The Stanford Computer Forum, operating for over two decades, is a cooperative venture of the Computer Systems Laboratory (jointly administered by the Departments of Computer Science and Electrical Engineering), the Computer Science Department, and a group of industrial affiliates. The Forum provides a mechanism for developing personal contacts between industrial researchers and their academic counterparts, promoting the exchange of the most advanced technical ideas between Stanford and industry. It acquaints the Stanford computer community with the special interests and concerns of industry and introduces Stanford students to industries and their problems involving computer theory and technology.

The Computer Forum is also important to Stanford as a source of significant funding. Membership contributions help foster innovation in Stanford's computer science and engineering programs. A healthy, vigorous industrial affiliates program is crucial to the vitality of the activities of the Computer Science Department and the Computer Systems Laboratory.

Computer Science and Computer Engineering at Stanford

The Departments of Computer Science and Electrical Engineering (including the Computer Systems Laboratory) at Stanford University are internationally recognized for their excellence. Their faculty members, research staff and students are widely known for leadership in developing new ideas and trends in the organization, design and use of computers. They are in the forefront of applying research results to a wide range of applications.

Researchers from these two organizations at Stanford are now engaged in investigations in such fields as programming languages, operating systems, distributed systems, networking, object-oriented programming, integrated circuits, database systems, computer-aided design, fault-tolerant computing, computer architecture, computer communications, office automation, artificial intelligence, program verification, numerical analysis, scientific computing, and algorithm analysis. Over 300 graduate students contribute to these studies.

How the Forum Operates

The Stanford Computer Forum offers a variety of benefits to its industrial members.

- Annual Meeting: The Forum holds an annual meeting in February to which three scientists from each member company are invited. The meeting lasts two days and features technical sessions at which timely computer research at Stanford is described by advanced graduate students and faculty members. There are opportunities for informal discussions to complement the presentations.

- Research Reports: One hardcopy subscription of all research reports issued by the Computer Systems Laboratory and the Department of Computer Science is sent either to individual members or to

corporate libraries. Additional hardcopy subscriptions are available for $400 a year each . Abstracts are mailed to an electronic mail list.

- Faculty Liaison: A faculty member or senior member of the research staff will act as the technical liaison to each Forum company. Each year interaction in the form of a personal visit to the company, a visit from company staff to Stanford (other than the annual meeting), or any other mutually agreeable technical communication will be arranged.

- Industrial Scholars: Companies find it beneficial to have one of their scientists or engineers visit Stanford for an extended stay to exchange ideas and collaborate with Stanford researchers. Such opportunities are available by mutual agreement between the Forum member company and a Stanford faculty member. Due to the expenses involved with such visits, additional funding is necessary.

- Student/Advisor/Mentor (SAM) program: The goal is to involve the graduate students more closely with the research problems of the Forum companies. The Forum member company may present a research problem/challenge to a faculty member. If the issue can be addressed within his/her research group, the professor will select a student to work with the member company on the problem under the direction of the faculty advisor. The Forum member company will nominate a Mentor to work with the student.

- Computer Forum Video Journal: The Video Journal is a collection of videotaped technical lectures that are available for licensing.

- Student Interviews: Forum members have an unrivaled opportunity to become familiar with the professional abilities and interests of Stanford students. Many of the presentations at the annual meeting are made by these students. Stanford assists Forum affiliates in meeting doctoral and master's students whose work they may find significant. The Forum provides members with Ph.D., M.S. and B.S. student biographies and can arrange individual interviews.

- Computer Guest Account: The Forum provides a guest account on the department computer system. Student resumes, CSD and CSL bibliographies and faculty research interest information are maintained on-line for our members.

Membership in the Forum

Membership in the Stanford Computer Forum is open to corporations with strong interests in computing — corporations that would both benefit from and contribute to this technical interchange.

The corporate membership fee is $15,000 per year. Because benefits are more fully realized through continued association, organizations are strongly encouraged to regard membership as a long-term commitment. The contribution represents an investment in a strong computer science and engineering program at Stanford, and provides an opportunity to watch that program continue its leadership in the computing community.
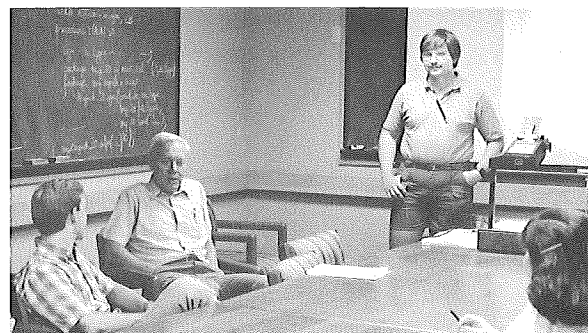
A special membership is available for small businesses with fewer than five hundred employees. The fee is $10,000 per year, and there is a slight reduction in benefits.

For further information, contact:

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